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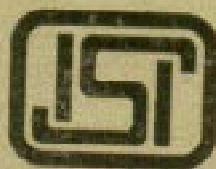
“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
CANNED BITTER GOURD (*KARELA*)
(*First Revision*)

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SPECIFICATION FOR

CANNED BITTER GOURD (*KARELA*)

(*First Revision*)

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Indian Standard
SPECIFICATION FOR
CANNED BITTER GOURD (*KARELA*)
(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 September 1976, after the draft finalized by the Fruits and Vegetables Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 The trade in canned bitter gourd (*KARELA*) is on increase. It is, however, necessary to ensure the quality of the product, if the demand is to be maintained and further developed. In order to ensure proper quality, it is desirable to have strict quality control based on specifications. It was, therefore, found necessary to formulate an Indian Standard specification for this product.

0.3 This standard was first issued in 1965. The Sectional Committee responsible for preparation of this standard felt that this specification be reviewed. In this revision definition of the term 'blemished' has been modified and new term 'disintegrated unit' has been added. Further, requirements, such as general, vacuum, head space, arsenic, lead, copper, zinc and net content in different can sizes have also been modified. Requirements for defects have been made more precise and reference to relevant Indian Standard for packing material has been incorporated.

0.4 In the preparation of this standard, due consideration has been given to the provisions of the Prevention of Food Adulteration Rules, 1955 and the Fruit Products Order, 1955. However, this standard is subject to the restrictions imposed under these statutes, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements for bitter gourd (*KARELA*) (*Momordica charantia* Linn.) canned in brine.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Head Space — The distance between the top of the double seam and the level of the surface of the contents.

2.2 Absence of Defects — The degree of freedom from extraneous material such as the ends of bitter gourd (*KARELA*) and also freedom from damage due to mechanical injury.

2.3 Blemished Units — Units that are blemished with some injury, such as wormhole, insect damage, physiological disorder or other abnormality such as sun burn, scab and enzyme activity on the surface, readily visible to the naked eye to a noticeable degree. A unit shall be considered blemished when the aggregate blemished area exceeds the area of a circle 0.32 cm in diameter. Uneven distribution of pigments and changes in colour normally associated with proper processing shall not be considered as defects.

2.4 Disintegrated Units — Units which have lost the normal shape or form, or from which some portion have been separated.

3. STYLES

3.1 The bitter gourd (*KARELA*) used for canning shall be in any one of the following forms:

- a) Whole pieces, unscrapped, with ends removed;
- b) Truncated cones, unscrapped, with ends removed; and
- c) Circular discs (should be uniform in size), unscrapped.

4. GRADES

4.1 Canned bitter gourd (*KARELA*) shall be of two grades, namely, Grade 1 and Grade 2.

5. REQUIREMENTS

5.1 Hygienic Requirements — The material shall be prepared and handled under strict hygienic conditions (*see* IS : 6542-1972*) by persons free from contagious and infectious diseases and only in premises maintained in a thoroughly clean and hygienic condition and having adequate and safe water supply. All workers shall use clean, white, washed clothing. Necessary precautions shall be taken to prevent incidental contamination of the product from soiled equipment or from personnel suffering from injuries.

*Code for hygienic conditions for fruit and vegetable canning units.

5.1.1 All equipment coming in contact with raw materials or products in the course of manufacture shall be kept clean. An ample supply of steam and water, and hose, brushes and other equipment necessary for proper cleaning of machinery and equipment shall be available. The equipment shall be properly cleaned by suitable chlorine solution having at least 50 mg/kg of available chlorine.

5.2 General — The bitter gourd (*KARELA*) selected for canning shall be of the proper stage of maturity and shall have the characteristic colour, flavour and texture, and shall be free from blemishes and damage by insects or disease. Colour of seeds shall not be red. Texture of seed shall not be hard. *KARELA* used should be of the same variety.

5.3 Freedom from Preservatives, Artificial Colouring Matter and Flavouring Agents — The material shall be free from any preservative, artificial colouring matter or flavouring agents.

5.4 Requirements for Covering Brine — The covering brine shall be clear. The only substances that may be added to the covering brine are edible common salt (sodium chloride) between 1 to 2 percent, with or without small quantity of sucrose, and citric or tartaric acid not exceeding 0.1 percent of the packing medium.

5.5 Requirements for the Finished Product — The contents of the can on opening shall display the following characteristics:

Grade 1 — The material shall possess a good, characteristic and practically uniform colour; shall be practically uniform in size; shall be practically free from defects; shall be practically free from disintegration; shall possess a characteristic, good texture and flavour; and shall be of such quality with respect to clarity of covering liquor as to score not less than 85 points.

Grade 2 — The material shall possess a characteristic and reasonably uniform colour; shall be reasonably uniform in size; shall be reasonably free from defects; shall be reasonably free from disintegration; shall possess a characteristic reasonably good texture and flavour; and shall be of such quality with respect to clarity of covering liquor as to score not less than 75 points.

The maximum and the minimum numbers of points to be scored by different factors shall be as given below:

	<i>Maximum</i>	<i>Minimum</i>	
		<i>Grade 1</i>	<i>Grade 2</i>
Colour	15	11	9
Texture and uniformity of size	25	19	17
Taste and flavour	20	15	13
Absence of defects	40	30	26

Scoring shall be done according to the method prescribed in Appendix A.

5.5.1 Colour

Grade 1 — The units shall possess a good, practically uniform colour, characteristic of bitter gourd (*KARELA*) of the proper maturity, which means that the colour of the units shall be pale green but not yellowish red or red indicative of very mature units, practically free from any bluish black or black discolouration either partly or wholly. Uneven distribution of pigments and change in colour normally associated with proper processing shall not be considered as defects.

Grade 2 — The units shall possess a good, reasonably uniform colour, characteristic of bitter gourd (*KARELA*) at the right stage of maturity, which means that the colour of the units shall be pale green but not yellowish red or red indicative of very mature units, reasonably free from any bluish black or black discolouration. Uneven distribution of pigments and change in colour normally associated with proper processing shall not be considered as defects.

5.5.2 Texture and Uniformity of Size

Grade 1 — The units shall possess practically good texture, which means that the units shall be just firm but not hard. The seeds of bitter gourd (*KARELA*) shall not be unduly hard and horny. The units shall be practically uniform in size.

Grade 2 — The units shall possess a reasonably good texture, which means that the units shall be reasonably firm but not hard. The seeds of the bitter gourd (*KARELA*) shall not be unduly hard and horny. The units shall be reasonably uniform in size.

5.5.3 Taste and Flavour

Grade 1 — The units shall possess the characteristic bitter taste of bitter gourd (*KARELA*). The units shall be completely devoid of any objectionable or off-taste, or objectionable smell and odour.

Grade 2 — The units shall possess characteristic bitter taste of bitter gourd (*KARELA*). The units shall be devoid of any objectionable or off-taste or objectionable smell and odour.

5.5.4 Absence of Defects

Grade 1 — The units shall be practically free from defects, which means that there shall not be present any extraneous material like the ends and there shall be present not more than 5 percent of blemished units, not more than 5 percent of disintegrated units and not more than 0.5 percent detached seeds calculated on the drained mass. The covering

brine shall be thin, practically clear and practically free from cloudiness and suspended matter and shall be practically free from blackening or discolouration.

Grade 2 — The units shall be reasonably free from defects which means that there shall not be present any extraneous material like the ends, and there shall be present not more than 10 percent of blemished units, not more than 10 percent of disintegrated units, not more than 1 percent of detached seeds calculated on the drained mass. The covering brine shall be thin, reasonably clear and reasonably free from cloudiness and suspended matter and shall be reasonably free from blackening or discolouration.

5.5.5 The material shall also conform to the requirements prescribed in Table 1.

TABLE 1 REQUIREMENTS FOR CANNED BITTER GOURD (KARELA)

Sl. No.	CHARACTERISTIC	REQUIREMENTS	METHOD OF TEST (REF TO CL No. OF IS : 2860-1964*)
(1)	(2)	(3)	(4)
i)	Vacuum in the can in mm, <i>Min</i>	150	5
ii)	Head space in the can in mm, <i>Max</i>	12	6
iii)	Drained mass of the contents of the can, as percentage of net mass, <i>Min</i>	60	7
iv)	Arsenic, mg/kg, <i>Max</i>	1.0	13
v)	Lead, mg/kg, <i>Max</i>	2.5	14
vi)	Copper, mg/kg, <i>Max</i>	5	15
vii)	Zinc, mg/kg, <i>Max</i>	5	16
viii)	Tin, mg/kg, <i>Max</i>	250	17
ix)	Microbiological requirements	To satisfy the requirements of the test	18

*Methods of sampling and test for processed fruits and vegetables.

6. PACKING AND MARKING

6.1 Packing

6.1.1 The material shall be packed in cans made of electrolytic or any other suitable tinplate. The cans shall be either plain or internally lacquered and hermetically sealed. The side seam shall also be lacquered. When lacquered internally, the lacquer shall be acid-resistant and shall not be destroyed, altered or its components transferred to the material inside the can during processing or subsequent storage or transport. The can exterior shall be free from dents, rust, perforations and seam distortions. The cans shall not show leaking, panelling or swell. The interior of the lacquered cans shall not show any visible black discolouration, rusting or pitting and the inside lacquer shall

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be in good condition. The interior of the plain cans may show visible black discolouration. Normal feathering shall not be considered as a defect.

6.1.2 The cans shall be filled with the material, without impairment of quality. The size of the cans and the net mass of their contents shall ordinarily be as given in Table 2. For determining the capacity and dimensions of cans method given in IS : 6093-1971* shall be followed. In case containers other than those specified in Table 2 are used, the size of the container and the net mass of the contents shall be as agreed to between the purchaser and the vendor.

TABLE 2 SIZES AND CAPACITIES OF CANS

SL No. (1)	TRADE SIZE (2)	NOMINAL DIAMETER (3)	NOMINAL HEIGHT (4)	NET MASS OF CONTENTS; (5)
		mm	mm	g
i)	301 × 409	77·8	115·9	400
ii)	401 × 411	103·2	119·1	800
iii)	603 × 700	157·2	177·8	2 890

6.1.3 Packing in Cases — The cans shall be packed in wooden packing cases (*see* IS : 1503-1967†) or corrugated board boxes or any other case as agreed to between the purchaser and the vendor.

6.2 Marking

6.2.1 Each can shall be marked with the following particulars:

- Name, style, and grade of the material with the brand name, if any;
- Name and address of the manufacturer;
- Net mass of the contents of the can in grams;
- Date of manufacture or code number indicating the date of manufacture; and
- Manufacturing licence number.

NOTE — Any other marking required under Packaged Commodities Regulation, 1975 shall also be marked on the can.

6.2.2 Each packing case shall also be marked with the following information:

- Name of the product;
- Number of cans × mass of each can;

*Method for determining the capacity and dimension of hermetically sealed metal food containers.

†Specification for wooden packing cases (*first revision*).

- c) Date of manufacture or code number indicating the date of manufacture;
- d) Manufacturing licence number; and
- e) Name and address of the manufacturer and gross mass.

6.3 The container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. SAMPLING

7.1 Representative samples of the material shall be drawn and tested for conformity to this standard by the method prescribed in 3 of IS : 2860-1964*.

8. TESTS

8.1 The samples of canned bitter gourd (*KARELA*) shall be tested for conformity of the material to the requirements of this specification by the methods given in IS : 2860-1964*. Reference to relevant clauses is given in col 4 of Table 1.

APPENDIX A

(*Clause 5.5*)

DETERMINATION OF THE GRADE OF THE PRODUCT

A-1. APPARATUS

A-1.1 White Porcelain Bowls — big enough to hold the contents of the can under examination.

A-1.2 Stainless Steel Spoons — Tablespoons.

*Methods of sampling and test for processed fruits and vegetables.

A-2. PROCEDURE

A-2.1 Panel of Judges — Judging for grading the product shall be done by a panel of three to five judges. All the judges constituting a panel shall be conversant with the factors governing the quality of the product. The cans shall be opened and the contents poured separately into white porcelain bowls. Each judge shall independently examine the contents from each of the cans and assign scores for different characteristics.

A-2.1.1 The judges shall consider the following characteristics: colour, texture and uniformity of size, taste and flavour, and absence of defects.

A-2.2 System of Scoring — The variations within each factor are so described that the scores may be ascertained for each factor and expressed numerically. The relative importance of each factor has been expressed numerically on a scale of 100. Each judge shall give a score for the individual factors, by the method described in Table 3 and record his observations in the Score Sheet for individual judge.

A-2.2.1 The scores as number of points given on the Score Sheet by the judges for the contents of each can for the four factors shall be recorded in a tabular form in the Score Card and the average score calculated for each factor with overall average for each can entered in the appropriate columns of the Score Card after complying with the conditions specified in A-2.3.1 and A-2.3.2

A-2.3 Ascertaining the Grade

A-2.3.1 Agreement Among Judges — To ascertain the consistency of judgement among the judges, the total score assigned by each of them for the contents of the same can shall be calculated by adding up the scores for the various individual characteristics. If the difference between the maximum and the minimum of the total score so obtained does not exceed $(K + 5)$, where K is the number of judges, the scoring shall be deemed as consistent for the can under consideration. If the difference exceeds $(K + 5)$, the most outlying score, that is, the one which is farthest from its immediate neighbour (the scores being arranged in one order), shall be discarded and the consistency among the remaining judges shall be examined.

A-2.3.2 When the consistency is thus established (A-2.3.1), the overall average scores given by the judges, whose scoring has been found to be consistent, shall be calculated for each can. The average score for each of the individual characteristics shall also be calculated by taking into account the corresponding scores as given by the same judges for the contents of the same can.

A-2.3.3 Assignment of Grade — In order to assign a grade for the contents of a can, the following procedure shall be adopted:

Grade 1 — The score for each factor individually (A-2.3.2) shall be not less than 75 percent of the maximum score obtainable, and the overall average score shall be not less than 85 points.

Grade 2 — The score for each factor individually (A-2.3.2) shall be not less than 65 percent of the maximum score obtainable, and the overall average score shall be not less than 75 points.

**TABLE 3 METHOD FOR GIVING SCORES FOR CANNED
BITTER GOURD (KARELA)**

(Clause A-2.2)

SL NO.	ORGANOLEPTIC CHARACTERISTIC	REQUIREMENTS	MAXIMUM NUMBER OF POINTS	PROPERTIES WHICH REDUCE THE VALUE	POINTS REDUCING THE VALUE UP TO
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour	Good pale green, uniform, characteristic of the variety and of bitter gourd of proper maturity; free from any bluish black or black discolouration. Uneven distribution of pigments and change in colour normally associated with proper processing shall not be considered as defects	15	Not quite uniform, slightly varying shades of the characteristic colour. Very slight discolouration Non-uniform, some units may have yellowish red colour. Some discolouration Dull, non-uniform, red colour, black discolouration	11 9 0
ii)	Texture and uniformity of size*	Good texture, just firm but not hard; seeds not unduly hard and horny. Uniform in size	25	Texture not very good. Some units slightly hard, seeds somewhat horny. Almost uniform size Units rather hard. Size varying within reasonable limits Leathery texture, very very hard units. Seed very very hard and horny. Size not at all uniform	19 16 0

(Continued)

**TABLE 3 METHOD FOR GIVING SCORES FOR CANNED
BITTER GOURD (*KARELA*) — *Contd***

SL No.	ORGANOLEPTIC CHARACTERISTIC	REQUIREMENTS	MAXIMUM NUMBER OF POINTS	PROPERTIES WHICH REDUCE THE VALUE	POINTS REDUCING THE VALUE UP TO
(1)	(2)	(3)	(4)	(5)	(6)
iii)	Taste and flavour	Pleasant flavour and bitter taste character- istic of bitter gourd (<i>KARELA</i>) : free from any objection- able odour. Free from sourness, stale- ness, or metallic taste	20	Slight variation in nor- mal bitter taste, a trace of metallic taste Rather a flat taste not so bitter as typical of <i>KARELA</i> , slight smell of sourness or sulphide odour Off-taste, bad flavour; strong offensive smell	15 13 0
iv)	Absence of defects†	Free from defects, no extraneous material present; free from blemished, disinteg- rated units. No detached seeds. Co- vering brine shall be clear, free from clou- diness, blackening or thickening and free from sediment	40	Blemished units up to 5 percent and disin- tegrated units up to 5 percent of the drained mass. Detach- ed seeds up to 0.5 percent of the drain- ed mass Blemished units up to 10 percent and disin- tegrated units up to 10 percent of the drained mass. Detach- ed seeds not very excessive Blemished and disinte- grated units above 10 percent of the drained mass. Exces- sive detached seeds	30 26 0

*While rating for 'Texture and uniformity of size', texture may be allotted 10 points and uniformity of size, 15 points.

†While rating for 'Absence of defects', a tentative maximum score of 15 points for the absence of blemished units, 10 points for absence of disintegrated units; 5 points for absence of detached seeds and 10 points for clarity of brine may be considered.

SCORE SHEET FOR INDIVIDUAL JUDGE

Sample No.

Date of Sampling.....

Details of the Sample Can:

a) Product.....

b) Name of Manufacturer.....

c) Type

d) Batch No.

e) Date of Manufacture

FACTOR	SCORE POINTS	SAMPLE CANS									
		1	2	3	4	5	6	7	8	9	10
Colour	Grade 1 : 11-15										
	Grade 2 : 9-10										
Texture and uniformity of size	Grade 1 : 23-30										
	Grade 2 : 17-19										
Taste and flavour	Grade 1 : 11-15										
	Grade 2 : 13-14										
Absence of defects	Grade 1 : 30-40										
	Grade 2 : 26-29										

Signature of the Judge with Date.....

SCORE CARD

Sample No.

Date of Sampling.....

Details of the Sample Can:

a) Product b) Name of Manufacturer c) Type

d) Batch No..... e) Date of Manufacture.....

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[illegible]

INDIAN STANDARDS ON

FRUITS AND VEGETABLES

IS:

2860-1964	Methods of sampling and test for processed fruits and vegetables
2867-1964	Canned mangoes
2868-1964	Canned pineapples
2869-1964	Canned orange segments
3245-1965	Canned peas in brine
3246-1965	Canned okra (<i>BHINDI</i>) in brine
3247-1976	Canned bitter gourd (<i>KARELA</i>) (<i>first revision</i>)
3248-1965	Canned tomatoes
3500-1966	Mango chutney
3501-1966	Pickles
3543-1966	Papain
3547-1976	Mango nectar (<i>first revision</i>)
3570-1965	Nomenclature of fruits
3880-1976	Canned mango pulp (<i>first revision</i>)
3881-1966	Tomato juice
3882-1966	Tomato ketchup
3883-1966	Canned tomato puree
3884-1966	Canned tomato paste
4624-1968	Dehydrated peas
4625-1968	Dehydrated carrots
4626-1968	Dehydrated potatoes
4627-1968	Dehydrated cabbage
4628-1968	Dehydrated okra (<i>BHINDI</i>)
4935-1968	Synthetic syrups
4936-1968	Fruit squashes
4939-1968	Methods of test for products derived from fruits and vegetables
5781-1970	Method for determination of total solids in fruits and vegetable products
5800-1970	Orange juice
5861-1970	Fruit jams, jellies and marmalades
7470-1974	Nomenclature of vegetables

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**AMENDMENT NO. 1 MAY 1996
TO
IS 3247 : 1976 SPECIFICATION FOR CANNED
BITTER GOURD (KARELA)**

(*Page 3, Foreword, clause 0.4*) — Insert the following new clause after 0.4 and renumber the subsequent clause:

'0.5 A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act, 1986* as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for canned bitter gourd (*KARELA*) are, therefore, included through Amendment No. 1 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as environment friendly, published in the Gazette of the Government of India.'

(*Page 7, clause 5.5.5*) — Insert the following new matter after 5.5.5:

"5.6 Additional Requirements for ECO-Mark

5.6.1 General Requirements

5.6.1.1 The product shall conform to the requirements prescribed under clauses 5.1 to 5.5.5.

5.6.1.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act, 1974*, *Water (PCP) Cess Act, 1977* and *Air (PCP) Act, 1981* along with the authorization if required under *Environment (Protection) Act, 1986* and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act, 1954* and the Rules made thereunder. Additionally, FPO 1955 (Fruit Product Order) framed under *Essential Commodities Act, 1955*, *Standards of Weights and Measures Act, 1977* requirements wherever applicable has to be complied with.

Amend No. 1 to IS 3247 : 1976

5.6.1.3 The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

5.6.1.4 The material used for product/packing shall be recyclable or biodegradable.

5.6.1.5 The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

5.6.1.6 The product shall be microbiologically safe when tested as per IS 5403 : 1969 'Method for yeast and mould count of foodstuffs' and IS 5887 (Part 5) : 1976 'Methods for detection of bacteria responsible for food poisoning: Part 5 Isolation, identification and enumeration of *Vibrio Cholerae* and *Vibrio Parahaemolyticus* (*first revision*)' and shall be free from bacterial and fungal toxins.

5.6.1.7 The pesticide residues, if any in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the Rules made thereunder.

5.6.1.8 The product/package or leaflet accompanying it may display instructions of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

5.6.2 Specific Requirements

5.6.2.1 The product shall not contain any of the heavy metal contaminants in excess of the quantities prescribed in Table 1."

(Page 9, clause 6.3) — Insert the following new clause after 6.3:

'6.4 ECO-Mark

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.'

(FAD 10)